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US006352828B1

(12) **United States Patent**
Brenner

(10) **Patent No.: US 6,352,828 B1**
(45) **Date of Patent: Mar. 5, 2002**

(54) **OLIGONUCLEOTIDE TAGS FOR SORTING AND IDENTIFICATION**

(75) Inventor: **Sydney Brenner**, Cambridge (GB)

(73) Assignee: **Lynx Therapeutics, Inc.**, Hayward, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/053,116**

(22) Filed: **Apr. 1, 1998**

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(51) **Int. Cl.**[7] **C12Q 1/68**; C12P 19/34; C12N 15/11; C07H 21/04

(52) **U.S. Cl.** **435/6**; 435/91.1; 536/23.1; 536/24.3; 536/24.33; 536/25.3; 536/25.32; 536/25.4

(58) **Field of Search** 435/6, 91.1; 536/23.1, 536/24.3, 24.33, 25.3, 25.32, 25.4

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,942,124	A	7/1990	Church	435/6
5,149,625	A	9/1992	Church	435/6
5,302,509	A	4/1994	Cheeseman	435/6
5,482,836	A	1/1996	Cantor et al.	435/6
5,514,543	A	5/1996	Grossman	435/6
5,552,278	A	9/1996	Brenner	435/6
5,599,675	A	2/1997	Brenner	435/6
5,604,097	A	2/1997	Brenner	435/6
5,635,400	A	6/1997	Brenner	435/320.1
5,654,413	A	8/1997	Brenner	536/22.1
5,658,736	A	8/1997	Wong	435/6
5,695,934	A	12/1997	Brenner	435/6
5,846,719	A	12/1998	Brenner et al.	435/6
5,863,722	A	1/1999	Brenner	435/6

FOREIGN PATENT DOCUMENTS

CA	2036946	10/1991
EP	303459 A3	2/1989
EP	392546 A2	10/1990
WO	90/03382	4/1990
WO	92/00091	1/1992
WO	92/10587	6/1992
WO	92/10588	6/1992
WO	93/06121	4/1993
WO	93/17126	9/1993
WO	93/21203	10/1993
WO	93/22680	11/1993
WO	93/22684	11/1993
WO	94/08051	4/1994
WO	95/20053	7/1995
WO	96/12014	4/1996
WO	96/12039	4/1996
WO	97/31256	8/1997

OTHER PUBLICATIONS

Search Report from International Patent Application PCT/US95/12791 (published as WO 96/12014).

Search Report from International Patent Application PCT/US96/09513 (published as WO 96/41011).

Aslandis, et al., "Ligation-independent Cloning of PCR Products (LIC-PCR)," *Nucleic Acids Research* 18:6069-6074 (1990).

Beck, et al., "A Strategy for the Amplification, Purification, and Selection of M13 Templates for Large-Scale DNA Sequencing," *Analytical Biochem.* 212:498-505 (1993).

Brenner, et al., "Encoded Combinatorial Chemistry," *Proc. Natl. Acad. Sci. U.S.A.* 89:5381-5383 (1992).

Broude, et al., "Enhanced DNA Sequencing by Hybridization," *Proc. Natl. Acad. Sci.* 91:3072-3076 (1994).

Brown, et al., "A New Base-Stable Linker for Solid-Phase Oligonucleotidee Synthesis," *J. Chem. Soc. Commun.* 891-893 (1989).

Chetverlin, et al., "Oligonucleotide Arrays: New Concepts and Possibilities," *Biotechnology* 12:1093-1099 (1994).

Church, et al., "Multiplex DNA Sequencing," *Science* 240:185-188 (1988).

Coche, et al., "Reducing Bias in cDNA Sequence Representation by Molecular Selection," *Nucleic Acids Research* 22:4545-4546 (1994).

Crick, et al., "Codes without Commas," *Proc. Natl. Acad. Sci.* 43:416-421 (1957).

(List continued on next page.)

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(57) **ABSTRACT**

The invention provides a method of tracking, identifying, and/or sorting classes or subpopulations of molecules by the use of oligonucleotide tags. Oligonucleotide tags of the invention comprise oligonucleotides selected from a minimally cross-hybridizing set. Preferably, such oligonucleotides each consist of a plurality of subunits 3 to 9 nucleotides in length. A subunit of a minimally cross-hybridizing set forms a duplex or triplex having two or more mismatches with the complement of any other subunit of the same set. The number of oligonucleotide tags available in a particular embodiment depends on the number of subunits per tag and on the length of the subunit. An important aspect of the invention is the use of the oligonucleotide tags for sorting polynucleotides by specifically hybridizing tags attached to the polynucleotides to their complements on solid phase supports. This embodiment provides a readily automated system for manipulating and sorting polynucleotides, particularly useful in large-scale parallel operations, such as large-scale DNA sequencing, mRNA fingerprinting, and the like, wherein many target polynucleotides or many segments of a single target polynucleotide are sequenced simultaneously.

16 Claims, 3 Drawing Sheets